obtained perfectly pure, having dissolved about one per cent. of the products of decomposition, which are not removed by subsequent crystallization.

Potash and soda in the cold unite with the nitroprussides, and form distinct salts, in which there is one equivalent of these alkalies for every equivalent of the baryle. These alkalies when heated with the nitroprussides decompose them altogether, forming peroxide of iron, hyponitrites, oxalic acid and ordinary ferrocyanides.

Sulphuretted hydrogen and soluble sulphurets also decompose the nitroprussides.

The formula of the nitroprussides is remarkably complex. Well-accordant analyses of all the salts permit no simpler relation between their carbon and iron than 24 equivs. of the former to 5 equivs. of the latter. The simpler proportion of 25 to 5 or 5 to 1, cannot be drawn legitimately from their composition. Analysis, and also a study of their transformation, show that they contain nitrous oxide, and have led to the complex formula

$$Fe_5Cy_{12}3NO+5R.$$

This is obviously a conjugate formula, and allows itself to be divided, for reasons now to be given, into the more simple expression

$$2(Fe_2Cy_5NO+2R)+(FeCy_2NO+R).$$

The relation of nitroprussides to ordinary prussides is supposed to be as follows:—

Both the ferrocyanides and the ferridcyanides are supposed to contain a common radical, one being quadribasic and the other tribasic, just as in the case of the modifications of phosphoric acid. A bibasic modification is therefore to be looked for. The formulæ would be as follows:

Ferrocyanides	$(Fe_2Cy_6)+4R.$
Ferridcyanides.....	$(Fe_2Cy_6)+3R.$
Hypothetical compound ..	$(Fe_2Cy_6)+2R.$

The nitroprussides are supposed to correspond to the last of the series, in which one equivalent of cyanogen is replaced by one equiv. of nitrous oxide. In the case of the beautiful purple compound produced by the soluble sulphurets on nitroprussides, this nitrous oxide is replaced by sulphuret of nitrogen. The hypothetical bibasic prusside necessary to establish this view has not yet been obtained; but the author states that experiments made with this view have already been so successful, that he shortly expects to announce it to the Society.

9. "On the Structure of the Dental Tissues of Marsupial Animals, and more especially of the Enamel." By John Tomes, Esq. Communicated by Dr. Grant, F.R.S.

The author of this communication, after examining microscopically the teeth of many marsupial animals taken from the majority of the families that make up the order Marsupialia, finds that they possess a structural character by which they may be distinguished from other

mammalian teeth, subject only to one of two exceptions; in which exceptions, however, the teeth are small and may readily be distinguished from marsupial by their external character. They are the teeth of the *Hyrax Capensis*, the British Shrews, and the molar teeth of the Jerboa.

The author states, that so far as he has had opportunities of examination, the teeth of the various species may also be distinguished, the one from the other. He points out, for instance, that, on comparison, the teeth of *Dasyurus ursinus* may be distinguished from the *D. macrourus*.

The peculiar characteristic of marsupial teeth exists in the continuation of the dentinal tubes into the enamel; so far as the author has investigated them, he finds but one exception, and that in the Wombat,—the representative of the rodents in the marsupial order. This creature, he finds, has teeth that are nearly allied in structure as well as external form to the teeth of rodents, and more especially to the Hare and Rabbit.

The author states, that he has observed that the dentinal tubes in the human and other teeth are sometimes continued for a short distance into the enamel. This he considers a rudimentary condition which is fully developed in the marsupial teeth. The author observes that the dentinal and enamel pulp become firmly united to each other previous to the commencement of calcification in either, and that it is highly probable that the linear columns of the two pulps are joined end to end, and that the columns of the enamel pulp so joined become developed into tubes instead of into solid enamel fibres. He considers this the more probable, as he has observed that the enamel fibres in an early stage of development are partially tubular in the teeth of several animals whose enamel fibres are ultimately solid.

The teeth described and figured are those of the—

Macropus giganteus.	Petaurus sciureus.
Hypsiprymnus penicillatus.	Dasyurus macrourus.
—— minor.	—— ursinus.
Phalangista vulpina.	Thylacinus cynocephalus.
Phascolomys Wombat.	Didelphis virginiana.
Petaurus taguanoides.	

The author considers that the facts stated in his paper justify two conclusions of a general character: first, that the existence of prolonged and fully-developed tubes in the enamel, continuous with those of the subjacent dentine, is common to the great majority, if not all, of the marsupial animals, excepting the Wombat; and, secondly, that the enamel and dentine are so closely related, that they should be regarded as modifications of each other, rather than as tissues of a wholly different nature.

10. "On the Motion of Gases."—Part II. By Thomas Graham, F.R.S. &c.

The experiments described by the author in the former paper on the